AMENDMENTS TO THE CLAIMS

Claims 1-40 (Cancelled)

Claim 41 (New) A modified animal fiber;

having a surface morphology that is substantially the same as that possessed by the fiber in its un-modified form, the fiber comprising epidermal tissue that exhibits an absorption band for $-SO_3H$ group having a relative absorbance of not less than 0.1 and an absorption band for $-S-SO_3Na$ group (Bunte salts) having a relative absorbance of not less than 0.08, when measured using reflection FT-IR having an absorption band corresponding to amide I set to 1,

the epidermal tissue having epicuticle layers which afford a water repellency, confirmed by an Allwörden reaction, that is substantially the same as that possessed by the fiber in its un-modified form,

wherein the fiber exhibits shrink proofing of an area shrinkage rate of not more than 8% in a three-hour aqueous washing when measured as a felting shrinkage rate in conformity with Woolmark Test Method 31 and pilling resistance of not lower than third class in JIS L-1076.6.1A method;

said fiber produced by a process which comprises:

a) a first step in which a cystine $-S-S-$ bond in cuticle layers on surface of the fiber is subjected to primary oxidation with an oxidizer having an ability to oxidize the $-S-S-$ bond in the cuticle layers under acidic conditions to contain a state rich in mono-oxidized state,

b) a second step in which the primary-oxidized $-S-S-$ bond is subjected to oxidation with ultrafine bubbles of an ozone/oxygen-mixed gas under acidic conditions into higher order oxidized states to contain di, tri or tetra-oxidized state and a mixture thereof, and

c) a third step in which said $-S-S-$ bond in higher oxidized state is subjected to reductive cleavage.

Claim 42 (New) The animal fiber according to Claim 41, wherein, as a measure of shrink proofing, the value represented by a difference (μ_a - μ_w) between the coefficient of friction in the tip to root direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lowered by 30% or more in comparison with the difference (μ_a - μ_w) of unmodified animal fiber in coefficient of static friction or in coefficient of dynamic friction, with the value of μ_a being approximately the same as a value in the case of the unmodified animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the unmodified animal fiber.

Claim 43 (New) The animal fiber according to Claim 41, wherein, as a measure of shrink proofing, the value represented by a difference (μ_a - μ_w) between the coefficient of friction in the tip to root direction (μ_a) and the coefficient of friction in the root to tip direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lower by 30% or more in comparison with the difference (μ_a - μ_w) of unmodified animal fiber in coefficient of static friction or in coefficient of dynamic friction, the value of μ_a being approximately the same as a value in the case of the unmodified animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the unmodified animal fiber.

Claim 44 (New) The animal fiber according to Claim 41, wherein the animal fiber is one selected from the group consisting of wool, mohair, alpaca, cashmere, llama, vicuna, camel and angora.

Claim 45 (New) The animal fiber of Claim 41, wherein the oxidizer is one or a mixture of two or more selected from the group consisting of persulfuric acid, peracetic acid, performic acid, neutral salts and acidic salts of these per-acids, potassium permanganate and hydrogen peroxide.

Claim 46 (New) The animal fiber of Claim 41, wherein the first step is conducted by a pad steam method of animal fiber into aqueous solution of oxidizing agent.

Claim 47 (New) The animal fiber of Claim 41, wherein the oxidation treatment with ozone is conducted by direct blowing 5 μm or less ultrafine bubbles of an ozone/oxygen-mixed gas fed from ozone-generator to the primary-oxidized animal fibers in aqueous and acidic treating liquid.

Claim 48 (New) The animal fiber of Claim 41, wherein the animal fiber is used as cloth or sliver mainly composed of animal fibers.

Claim 49 (New) The animal fiber of Claim 41, wherein the reductive cleavage is carried out using sulfites.

Claim 50 (New) The animal fiber of Claim 41, wherein the reductive cleavage is carried out using sodium sulfites or acidic sodium sulfite.

Claim 51 (New) The animal fiber of Claim 41, wherein the reductive cleavage is carried out using sodium sulfites.

Claim 52 (New). A modified animal fiber;

having a surface morphology that is substantially the same as that possessed by the fiber in its unmodified form, the fiber comprising epidermal tissue that exhibits an absorption band for -SO_3H group having a relative absorbance of not less than 0.1 and by an absorption band for -S-SO_3Na group (Bunte salts) having a relative absorbance of not less than 0.08, when measured using reflection FT-IR having an absorption band corresponding to amide I set to 1,

the epidermal tissue having epicuticle layers which afford a water repellency, confirmed by an Allwörden reaction, that is substantially the same as that possessed by the fiber in its unmodified form,

wherein the fiber exhibits shrink proofing of an area shrinkage rate of not more than 8% in a three-hour aqueous washing when measured as a felting shrinkage rate in conformity with

Woolmark Test Method 31 and pilling resistance of not lower than third class in JIS L-1076.6.1A method.

Claim 53 (New) The animal fiber according to Claim 52, wherein, as a measure of shrink proofing, the value represented by a difference (μ_a - μ_w) between the coefficient of friction in the tip to root direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lowered by 30% or more in comparison with the difference (μ_a - μ_w) of unmodified animal fiber in coefficient of static friction or in coefficient of dynamic friction, with the value of μ_a being approximately the same as a value in the case of the unmodified animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the unmodified animal fiber.

Claim 54 (New) The animal fiber according to Claim 52, wherein, as a measure of shrink proofing, the value represented by a difference (μ_a - μ_w) between the coefficient of friction in the tip to root direction (μ_a) and the coefficient of friction in the root to tip direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lower by 30% or more in comparison with the difference (μ_a - μ_w) of unmodified animal fiber in coefficient of static friction or in coefficient of dynamic friction, the value of μ_a being approximately the same as a value in the case of the unmodified animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the unmodified animal fiber.

Claim 55 (New) The animal fiber according to Claim 52, wherein the animal fiber is one selected from the group consisting of wool, mohair, alpaca, cashmere, llama, vicuna, camel and angora.